Summary Report of the World Trade Center Technical Review Panel Meeting

May 24, 2004

FINAL DRAFT 06/15/04

Prepared for:

Office of the Science Advisor
U.S. Environmental Protection Agency
Washington, DC

Prepared by:

Eastern Research Group, Inc.
110 Hartwell Avenue
Lexington, MA 02421

NOTICE

This report was prepared by Eastern Research Group, Inc., an EPA contractor, as a general record of discussion held during the third meeting of the World Trade Center Technical Review Panel held May 24, 2004 at St. John's University. This report captures the main points and highlights of the meeting. It is not a complete record of all details discussed, nor does it embellish, interpret, or enlarge upon matters that were incomplete or unclear. Statements represent the individual view of each meeting participant, and may or may not represent the analyses or positions of EPA.

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ACRONYMS

CBPR	Community-Based Participatory Research
DEP	Department of Environmental Protection
EPA	U.S. Environmental Protection Agency
HVAC	Heating, ventilation, and air conditioning
MMVF	man-made vitreous fibers
NCEA	National Center for Environmental Assessment
NYC	New York City
NYU	New York University
OSHA	Occupational Safety and Health Administration
USGS	U.S. Geological Survey
WTC	World Trade Center

EXECUTIVE SUMMARY

After the collapse of the World Trade Center (WTC) and the subsequent release of contaminants into the environment, the U.S. Environmental Protection Agency (EPA), other federal agencies, New York City (NYC), and New York State public health and environmental authorities focused on numerous cleanup, dust collection, and ambient air monitoring activities to ameliorate and better understand the human health effects of the disaster. While these monitoring and assessment activities were ongoing, EPA began planning for a program to clean and monitor residential apartments. Residents impacted by the World Trade Center dust and debris were eligible to request federally funded monitoring and/or cleaning of their residences. The cleanup continued into the summer of 2003, by which time EPA had cleaned and monitored 3,400 apartments and monitored an additional 800 apartments.

EPA convened a technical panel of experts who have been involved with the World Trade Center assessment activities to provide advice on the effectiveness of these and related programs. Dr. Paul Gilman, EPA Science Advisor, serves as the chairperson, and Dr. Paul Lioy, Professor of Environmental and Community Medicine at the Environmental and Occupational Health Sciences Institute of the Robert Wood Johnson Medical School-UMDNJ and Rutgers University, serves as vice chair. This report summarizes the third technical panel meeting in New York City, held at St. John's University in Saval Auditorium on May 24, 2004.

Dr. Gilman and Dr. Lioy facilitated the meeting and presented opening comments on the agenda for the meeting. Four presentations were made by panelists representing panel subgroups:

- Development of a WTC dust signature (presented by Greg Meeker)
- Other sources of WTC sampling data (presented by David Newman)
- Community participation (presented by Catherine McVay Hughes)
- WTC Combustion Emissions (presented by Dr. Lung Chi Chen, sitting in for panelist Morton Lippman)

The panel discussed each presentation and issues related to the development of a sampling design. The public was invited to make comments during two public comment sessions in the afternoon. At the end of the meeting, Dr. Gilman summarized the key conclusions and ideas proposed by individual panelists. These included:

- A single signature will not be representative of all WTC contamination.

- EPA should consider a phased approach to sampling and analysis.

- Sampling Phase 1 could include extensive sampling to allow for analyzing a broad range of contaminants from many different areas. Then, a smaller number of the samples could be analyzed for selected contaminants as part of the Phase 1 screening program.

- EPA should solicit community input on the idea of conducting an intensive sampling effort in an area close to the WTC, with limited analysis and sample archiving, versus a geographically broader screening program.

- Instead of pre-selecting buildings and locations to sample, EPA could provide testing and cleaning for anyone who requested it.

- EPA needs to inform the users of a sampled area of what results (which analytes) will be available and when they will see these results.

- The issue of how to address privacy concerns associated with testing and using data from private spaces should be considered.

- The following should be included on the agenda for the next technical panel meeting:
  - How to better incorporate public participation into the process.
  - Presentation on studies of organic contamination from the WTC.
  - Discussion of proposals associated with a new sampling program, as developed by EPA's National Center for Environmental Assessment and EPA Region 2.

1. INTRODUCTION

After the collapse of the World Trade Center (WTC) and the subsequent release of contaminants into the environment, the U.S. Environmental Protection Agency (EPA), other federal agencies, New York City (NYC), and New York State public health and environmental authorities focused on numerous cleanup, dust collection, and ambient air monitoring activities to ameliorate and better understand the human health effects of the disaster. While these monitoring and assessment activities were ongoing, EPA began planning for a program to clean and monitor residential apartments. Residents impacted by the World Trade Center dust and debris were eligible to request federally funded monitoring and/or cleaning of their residences. The cleanup continued into the summer of 2003, by which time EPA had cleaned and monitored 3,400 apartments and monitored an additional 800 apartments. Since then, EPA developed a draft resampling plan to study the recontamination of residences that were cleaned under the initial program or were inspected and determined to not require cleaning.

EPA convened a technical panel of experts who have been involved with the World Trade Center assessment activities to provide advice on the effectiveness of these and related programs. Dr. Paul Gilman, EPA Science Advisor, serves as the chairperson, and Dr. Paul Lioy, Professor of Environmental and Community Medicine at the Environmental and Occupational Health Sciences Institute of the Robert Wood Johnson Medical School-UMDNJ and Rutgers University, serves as vice chair. Members of the panel include representatives from the federal agencies directly involved in the air quality response and monitoring, the New York City Departments of Health and Environmental Protection, and outside experts.

EPA's goals in forming this panel and holding the current and planned meetings are:

- To obtain more input on ongoing efforts to monitor the situation for New York residents and workers impacted by the collapse of the WTC.
- To help guide EPA's use of the available exposure and health surveillance databases and registries to characterize any remaining exposures and risks, identify any unmet public health needs, and recommend any steps to further minimize the risks associated with the aftermath of the WTC attacks.

Three technical panel meetings and one conference call have been held to date:

- March 31, 2004 at the Alexander Hamilton U.S. Customs House;
- April 12, 2004 at the Tribeca Performing Arts Center at the Borough of Manhattan Community College;
- May 12, 2004 conference call; and
- May 24, 2004 at Saval Auditorium at St. Johns University.

This report summarizes the presentations and panel discussions at the May 24 technical panel meeting held at St. John's University. Information on each of these meetings is provided on EPA's website (http://www.epa.gov/wtc/panel).

1.1 Attendees

All of the panelists were present at the meeting except for Morton Lippman and Claudia Thompson. For this meeting, Dr. Lung Chi Chen sat with the panel in Lippman's place. Additionally, Mark Wilkenfeld, a professor of medicine at the Columbia University Health Sciences Division, sat with the panel at the request of City Councilman Allen Gerson.

1.2 Purpose

The purpose of this technical panel meeting was to discuss specific elements that could be incorporated into a draft sampling plan. These elements were discussed at previous meetings, and three subgroups were formed to collect more information on:

- Development of a WTC dust signature (led by Greg Meeker)
- Other sources of WTC sampling data (led by David Newman)
- Community participation (led by Catherine McVay Hughes)

The May 24 meeting included presentation and discussion of the workgroup research results, as well as consideration of other elements relevant to development of a sampling plan.

1.3 Agenda

The meeting began at 10:15 a.m. Drs. Gilman and Lioy summarized the purpose of the meeting and the formation of the panel subgroups. Then, the subgroup leaders presented the results of their research, after which the panelists discussed the presentations. Then, Dr. Lung Chi Chen made a presentation on WTC combustion emissions. The meeting adjourned for lunch at 12:20 p.m. and reconvened at 1:00 p.m. Public comments were held for one hour, after which the panelists discussed Dr. Chen's presentation. The panelists then discussed the sampling design proposals presented in the paper that EPA provided as part of the meeting package. Dr. Gilman summarized the main comments from the meeting, and then the public again provided comments from 4:30 until 5:20 p.m. Gilman adjourned the meeting at 5:20 p.m. The agenda for this meeting is contained in Attachment A to this report.

2. WELCOME, PURPOSE, AND TELECONFERENCE SUMMARY

Dr. Paul Gilman, EPA Science Advisor
Paul Lioy, Professor of Environmental and Community Medicine at the Environmental and Occupational Health Sciences Institute of the Robert Wood Johnson Medical School–University of Medicine and Dentistry of New Jersey and Rutgers University

Gilman opened the meeting by welcoming the participants. He summarized the formation of panel subgroups during the May 12, 2004 conference call, and he emphasized the need for attention to community participation and input. He reviewed the agenda for the meeting. Gilman noted that Mark Wilkenfeld is sitting with the panel at the request of City Councilman Allen Gerson, as was noted on the conference call. Additionally, Dr. Lung Chi Chen was sitting for Morton Lippman, who was unable to attend. Gilman then reviewed the formation of the subgroups and explained their purpose.

Lioy stated that he hoped the format for the meetings will move toward a question-and-answer format as the meetings focus more on the details of sample design. Lioy stated that the panel subgroups (subpanels) were formed to allow panelists to focus on specific challenging questions within their fields of expertise, and he commented that this is a typical part of the way technical panels operate. He encouraged interaction between the panelists and the community so that the panel can receive their ideas and translate them into the sampling design. He also noted that when a panelist is out of town, it is appropriate for the panelist to designate someone to represent them in their absence.

3. DEVELOPMENT OF A SIGNATURE FOR WTC DUST

Greg Meeker, U.S. Geological Survey (USGS)

Greg Meeker presented an overview of his recent research applicable to identifying a signature for WTC contamination. He indicated that he prepared a draft document that was distributed to the panel prior to this meeting, and summarized that document in his presentation. Meeker presented microscope slides of WTC dust from samples collected by USGS, which contained three primary components: man-made vitreous fibers (MMVF), concrete, and gypsum. He expressed three concerns in using a WTC signature for the proposed sampling program:

- All of the components present in the signature are common building components. If these components are measured in a sample, the analyst will need to consider if a source other than WTC generated the components.
- All buildings are different in physical configuration, ventilation, and construction materials used.
- The ongoing construction and renovation of residential areas in formerly industrial and commercial areas may generate contamination and interfere with this analysis.

Meeker proposed that a background study be initiated to confirm that the proposed signature profile is not present in archived EPA background samples or in background

samples collected and archived by other agencies, or even in samples that could be collected anew in background settings. If this study proves that the signature is not present in background samples, then the previously collected WTC dust samples should be reanalyzed to determine if the signature is present consistently among these samples. From these data, a detection limit, applicable sampling units, typical dust concentrations, and required analytical tools could be estimated. Meeker's slides are located on the EPA WTC website.

Panel Discussion

Markowitz asked if slag wool is still used in building construction. Rodenbeck believed that it was; however, Markowitz thought perhaps it was used more commonly in the past.

Meeker pointed out that the use of the signature profile assumes that the dust is not going to fractionate upon settling in different areas. This assumption is based on samples analyzed to date, in which the major components of the dust remained in approximately the same ratios. Meeker expected that the extremely fine dust may not follow this pattern, and noted that Dr. Chen would speak to this issue in his presentation later in the meeting.

Stellman asked for clarification on what the presence of the signature dust would imply about the concentration of other contaminants. Meeker explained that previous work suggests that metal contaminants should be proportional to the concentration of a signature; however, organics would have to be measured differently. Once these studies are completed and more information is established regarding the detection limits and dilution levels, conclusions about the absence of the signature may then be determined.

Markowitz noted that some buildings and offices might have additional dust superimposed over the old WTC dust, and asked if the presence of any slag wool indicates the presence of WTC. Meeker thought that the presence of any slag wool could indicate WTC contamination; however, each building is different. Perera asked if the signature might change over time. Meeker thought the alkalinity and the dilution of the signature might change over time, but not the signature itself. Chen clarified that the analysis should be able to segregate one signature from another, so that if the WTC signature were present in a sample that also contained typical urban NYC dust, then each of those signatures should be able to be segregated and analyzed.

Lioy and Meeker reiterated that this signature may not be appropriate for very fine particulates (specifically, less than 20 microns), and that Chen's later presentation will provide more information on the fine particulates from WTC.

Stellman commented that there needs to be discussion on how the use of archived samples would differ from the use of newly collected samples. Additionally, the sampling plan should be clear, for the benefit of both the public and the panel, about what is being analyzed (e.g., the contaminants of concern versus the signature profile, or both.)

4. SOURCES OF WTC SAMPLING DATA

David Newman, New York Committee for Occupational Safety and Health

Newman presented a list of known data sources identified by his subpanel that may provide WTC data, including:

- Occupational Safety and Health Administration (OSHA)
- NYC Department of Environmental Protection (NYC DEP) exterior building survey results
- NYC DEP letter to residents for asbestos testing results
- World Trade Center Air Monitoring Activities by Various Entities, Final Report, March 17, 2003 (EPA)

Newman then presented other potential sources of data that may be further investigated:

- Building owners, building managers, apartment owners, tenants, and tenant organizations
- Private employers and private sector workers and unions
- Government agencies and public sector workers and unions
- Insurance companies
- AIHA, Metro AIHA, ACGIH
- Laboratories
- Environmental consultants and cleanup companies
- Community boards and community organizations
- Physicians and other health care professionals
- Government agencies (subject to Freedom of Information Law requests)
- Public and private sector employers (upon request by employee or union, per 29 CFR 1910.1020 - Access to Employee Exposure and Medical Records)

Newman read a panelist comment that said EPA might not be the best organization to request these data, and presented potential limitations in using gathered data. Newman's slides are located on the WTC website.

Panel Discussion

Prezant commented that, while there are certainly limitations to using these data, gathering the data into a single location would be very beneficial. These data could be compiled in an open access database for users in the U.S. and internationally. That being said, the quality of the data will vary for each dataset. Therefore, their usefulness to this project may be limited.

Newman suggested that there is historical value to compiling these data. Additionally, panelists cannot know the specific value the data may have to the proposed sampling program until the data are collected and reviewed. These data might be useful to inform the development of a sampling or cleanup program, including identification of buildings.

Prezant suggested that if panelists agree that collecting all data associated with the WTC collapse was broader than the scope of this project, then perhaps one or two notable studies could be investigated instead. Perera agreed with this point, and suggested that criteria be set forth to determine if a dataset meets the quality assurance needs for this program, or if it is simply historically valuable. Newman thought that establishing criteria for data selection would be impossible before knowing what those data are. Markowitz suggested that methods for data selection should be very carefully considered, but understood that collecting all of this information might be a significant effort with limited applicability to the panel formation's specific objectives.

5. COMMUNITY PARTICIPATION

Catherine McVay Hughes, Community Liaison

Catherine McVay Hughes first identified the make up of the affected WTC community. She explained the current mechanisms available to the community for access to the panel discussions, and expressed that the community feels these are inadequate. McVay Hughes presented a number of ways to improve this process, including:

- Informing the public in a timely and effective manner of:
  - Agendas
  - Proposals
  - Panel meetings
  - Transcripts/minutes
- Using E-docket (online public docket & comment system)
- Avoiding conference phone calls
- Adoption of Community-Based Participatory Research (CBPR)

McVay Hughes explained the concept of CBPR and how it meets EPA protocols for community involvement. She referred panel members to a paper she had distributed to them discussing CBPR. McVay Hughes concluded her presentation with the following recommendations:

- A mutually agreed-upon expert in CBPR needs to be immediately engaged to formalize the CBPR process.
- Resources need to be made available to the community so that it can participate in CBPR in a meaningful way.
- The community wants to make very clear that it is not interested in expediency at the expense of a scientifically valid attempt to find out what WTC contamination remains.

Panel Discussion

Prezant noted that all of these suggestions are valid, and that panelists recognize the need to better incorporate public participation and these methods may be one way to do this. He noted that no formal recommendations have been made to EPA at this point, and there

is clearly time to improve the public participation process. Prezant asked for clarification on the last recommendation of the slide, in which the community prefers a scientifically valid study versus expediency. Prezant noted this statement somewhat contradicts what many public commenters have noted to the panel, that timing is critical and that too much time has already passed. He stated that the method for meeting these goals should be carefully considered.

Markowitz stated that, despite this limitation, he supported expanding community involvement using an iterative process to meet the needs of the program. McVay Hughes noted that the community wants to increase their involvement but does not want to slow the process. Perera noted that the adoption of CBPR at the Columbia Center for Children's Health added more meetings and planning and, therefore, added some time to the process. Stellman noted that this community group is already well established and organized. As long as the appointed facilitator is very good at CBPR, there should be no significant delay as a result of adopting this protocol.

Markowitz noted there is always a balance between scientific merit and time. He believes the process currently is adequately balanced and will continue to be. Perera asked Gilman who is the community liaison person at EPA, and Gilman indicated he would forward that information to McVay Hughes.

6. WTC COMBUSTION EMISSIONS

Dr. Lung Chi Chen, Research Assistant Professor at the New York University School of Medicine

Lung Chi Chen reviewed the New York University (NYU) WTC investigations into air particle pollution and summarized the continuing related efforts at NYU. He noted that the initial toxicological studies from EPA and the University of Rochester did not indicate remarkable health effects due to WTC exposure; however, many residents have developed persistent and new respiratory symptoms. Chen reviewed the particle samples that were collected and analyzed and noted the sampling locations. He described the analytical techniques and the development of WTC tracers for these samples. Tracers were found for WTC combustion particles as well as WTC demolition dust tracers.

Panel Discussion

Prezant commented that Chen's presentation raised many good questions, including how the treatment of large versus small particulates. Large particulates are not as likely to penetrate the lower airways; however, under extreme conditions, the large particles may be getting through. The signatures need to encompass both large and small particulates. Chen agreed with Prezant's comments.

7. DISCUSSION OF PROPOSED SAMPLING DESIGNS

As part of the information package delivered to the panel prior to the meeting, and in response to a request made during the May 12, 2004 teleconference, EPA's National Center for Environmental Assessment (NCEA) and Region 2 prepared a draft paper outlining various options for a new sampling design.

Identification of Sampling Locations

Lioy agreed with Jo Polett's public comment that the geographic extent of sampling should at least consider where the plume was seen to have traveled. Lioy thought that this geographic extent could define the first phase of sampling in which areas could be sampled using the prioritized approach developed by the group. This prioritized approach may include extensive sampling and more limited analysis at first, archiving samples for later analysis as needed.

Markowitz asked if they were now considering Brooklyn and areas above Canal Street in the sampling area. Lioy stated that the extent of sampling could be determined by the results of the first phase of sampling, which might use archived samples to determine the extent of that phase. Jo Polett asked that the collection locations of all archived samples being considered for use in this study be posted to the WTC web site. McVay Hughes suggested that they note all of the buildings about which public comments were made, and consider these in the sampling.

Stellman and Prezant discussed the utility of mapping health effects to determine the geographic extent of sampling and cleaning. Prezant cautioned that some health effects might be related to the initial dose received on or after 9/11, and not from continuing exposure. The purpose of the sampling effort should be clearly stated as an assessment of building exposure and not an assessment of human exposure. Stellman believed that health effects should still be a consideration in determining the geographic extent of sampling.

Objectives of Sampling Program

Prezant outlined his understanding of the panel's mission:

- To foster scientific health and environmental research concerning the effects of the WTC disaster.
- To facilitate the removal of WTC contamination from buildings.

He stated that sampling plan design depends on which goal it supports. Prezant suggested that EPA evaluate the cost of cleaning all areas requesting cleaning versus the cost of any of the proposed sampling and analysis programs. Lioy agreed with this suggestion, but added that testing is needed before and after cleaning to verify that the cleaning was effective. Rodenbeck stated that the additional sampling is necessary to determine which contaminants a cleaning program should focus on. Prezant stated that

the purpose of this type of sampling design would be to determine the extent and type of remaining WTC residual contamination in buildings and not the extent of health effects. Stellman suggested combining cleaning and testing at the same time for the screening phase of the program. Prezant stated that a timeline should be presented for all the options considered.

Development of Signature Profile

Gilman noted that the public had some concerns that the signature profiles being discussed would be used in place of testing for other contaminants. Chen clarified that the development of the signature is not intended to preclude testing for other contaminants. Gilman noted that, at the second technical panel meeting, a suggestion was made to use the presence of a signature profile to identify the presence or estimate the concentrations of contaminants of concern using an algorithm. Meeker suggested instead that the presence of the signature could trigger analysis of the other contaminants of interest. These contaminants would be analyzed in conjunction with the signature profile for all samples until there is confidence that the presence of the signature profile signifies the other contaminants, and until a detection limit and dilution factors have been developed for the use of the signature profile. Newman agreed, noting that analyzing the samples for both the signature profile and the contaminants would provide an opportunity to further define the signature.

Gilman asked if the signature should be developed using new samples or samples collected and archived during the initial sampling effort. Meeker stated that the signature profile should be developed initially using the archived samples, although he expressed concern that there were no archived wipe samples available.

Newman asked for discussion on the significance of finding versus not finding the signature profile in the collected samples. If the sample indicates that WTC dust is not present, does that mean that the apartment or space will not be cleaned? If the WTC dust is identified, does that mean that the area will be further sampled and cleaned?

8. PAUL GILMAN'S RECAP AND SUMMARY

Gilman reviewed the panel discussions on establishing a new sampling plan. He stated that individual panel members feel that a sampling plan focused only on recontamination is being dismissed for a broader study. It was noted that inclusion of some spaces covered in the original study would be acceptable.

Gilman listed the four proposed options described in Matt Lorber's summary of sampling programs, which was distributed to panel members prior to the meeting. Lorber clarified that none of these programs included cleaning, and that there should be discussion on what action would be taken after sampling. McVay Hughes noted that the sampling locations should include only places where people live and work. Stellman asked the community to comment on the use of a set of surrogate buildings to represent a larger set

of buildings to which the analytical data would be extrapolated. Markowitz noted that Option 2 seemed to consider only apartments and that Option 3 considered a broader range of buildings. He noted that a broader range is more appropriate, and that heating, ventilation, and air conditioning (HVAC) sampling should also be evaluated in detail.

Some specific suggestions were made for EPA to consider in drafting a new sampling design:

1) A single signature will not be representative of all WTC contamination. Two possibilities for signature profiles were presented in the panel meeting: one for the collapsed building dust and another for combustion particulates. Perera requested that Lioy present his information on organic contamination from the WTC during the next panel meeting. She also suggested that the variation of signature profiles with increasing distance from ground zero should be considered. Lioy noted that a timeline should be specified for the development of the signature.

2) EPA should consider a phased approach to sampling and analysis. After the signature profiles are developed using existing archived data, these signature profiles may be used in subsequent sampling. Phase 1 could include sampling locations close to the WTC (for example, within 1.5 kilometers) for the signature profiles and other contaminants. These analytical data could be used to validate or invalidate the use of the signature profiles. Then, the geographic extent and analytes for the Phase 2 sampling may be determined by the results of Phase 1 sampling. A timeline should be developed for Phase 1.

3) If using a phased approach, Phase 1 could include extensive sampling to allow for analyzing a broad range of contaminants from many different areas, then a smaller number of the samples could be analyzed for selected contaminants as part of the Phase 1 screening program. Based on the Phase 1 screening results, the additional collected samples could then be analyzed for other contaminants and locations as needed.

4) EPA should solicit community input on the idea of conducting an intensive sampling effort in an area close to the WTC, with limited analysis and sample archiving, versus a geographically broader screening program. EPA should present the advantages and disadvantages of each option, and solicit input from the community members on their preferred options.

5) Instead of pre-selecting buildings and locations to sample, EPA could provide testing and cleaning for anyone who requested it. Prezant added that this may not be a useful approach for establishing the signature and initial sample screening phase, but may be useful after these phases.

6) EPA needs to inform the users of a sampled area of what results (which analytes) will be available and when they will see these results. If samples will be archived for later analysis, EPA should inform the public of that intent.

7) Privacy concerns associated with testing and using data from private spaces should be addressed.

It was suggested that the following items be included on the agenda for the next technical panel meeting:

- How to better incorporate public participation into the process.
- Presentation on studies of organic contamination from the WTC.
- Discussion of proposals associated with a new sampling program, as developed by EPA's NCEA and Region 2.

9. PUBLIC COMMENTS

Two public comment sessions were held during the meeting: from 1:00 p.m. to 2:00 p.m. and from 4:30 p.m. to 5:00 p.m. Prior to the first public comment session, Gilman announced that, in response to concerns over the accuracy of the summaries of the public comments in the meeting reports, the public comments would no longer be summarized in panel meeting reports. Instead, all public comments that are submitted in writing will be included in an attachment to the meeting report. The following members of the public made comments to the panel:

Barbara Caporale
Jenna Orkin
Jo Polett
Kimberly Flynn
Susanne Mattei
Joel Greenberg
Nina Lavin
Robert Gulack
Paul Stein
Komilla John
Frank Goldsmith
Stanley Mark
Mae Lee
Marjorie Clark
Milton Diaz
Craig Hall
Annie Wilson
Beverly Peterson
Caroline Martin
Harriet Grimm

Nancy Han

Comments that were received in writing are provided in Attachment B to this report.